As soon as an artist applies paint to canvas or another support, complex chemical and physical processes start to take place as the film changes from a viscous medium to the cross-linked network that constitutes the dry paint. The composition of the pigments and of the organic binding media, as well as the stratigraphy of the paint and presence of other components in the mixture, considerably affect the drying process. Environmental conditions such as light, temperature, relative humidity, and the presence of pollutants play a key role in how paint films age and degrade. Conservation treatments with aqueous or organic cleaning agents, or those that involve heat, may also trigger various modes of deterioration. Understanding these complex processes is crucial for determining why paintings look the way they do, whether the surface texture, opacity, and depth of tone of paint layers are as the artist intended or are the result of changes that have occurred over time, and for making decisions regarding the conservation and preservation of the works.

The talk will discuss what interdisciplinary teams involving scientists, conservators, and art historians at The Met together with colleagues in numerous other institutions have begun to unravel about the artistic techniques and the permanence of the materials in iconic works of art by Rembrandt van Rijn, Vincent van Gogh, Jan van Eyck, Adolph Gottlieb, and others, what the implications of these findings for the conservation and preservation of the works affected are, and the challenges that still lie ahead.

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